

REMARKS

Applicants' representative appreciates the removal of the previous rejection by the Examiner. Claims 1-8 are resubmitted for reconsideration.

Claims 1-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Komroff et al. U.S. Patent No. 3,635,001. Applicant respectfully traverses this rejection and submits that Komroff neither teaches nor suggests all of the recited elements in independent claims 1 and 8.

Independent claim 1, upon which claims 2-7 depend, recites an end of service life indicator comprising a housing member (10) having a front side and a back side. The housing member is constructed of a solid material and has a plurality of housing openings (10a) extending from the front side to the back side of the housing member. Each of the housing openings has a sufficient cross-sectional area to allow a fluid medium (F) and particulates (P) to pass. A filter member (20) is disposed adjacent to the housing member. The filter member comprises a porous solid through which fluid medium can pass. The filter member is adapted to adhere to the particulates. A template member (30) is disposed adjacent to the filter member. The template member comprises a solid material that is substantially impervious to the fluid medium. The template member (30) has a front side and a back side and a template opening pattern (50). The template opening pattern comprises an opening in the template member that extends from the front side to the back side of the template member.

Independent claim 8 recites an end of service life indicator comprising a housing member (10) having a front side and a back side. The housing member is constructed of a solid material and has a plurality of housing openings (10a) extending from the front side to the back side of the housing member. Each of the housing openings are of sufficient cross-sectional area to allow a fluid medium (F) and particulates (P) to pass. A filter member (20) is disposed adjacent to the housing member. The filter member comprises a porous solid through which the fluid medium can pass. The filter member is adapted to adhere to the particulates. A template member (30) is disposed adjacent to the filter member and comprised of a solid material. The solid material is substantially impervious to the fluid medium. The template member (30) has a front side and a back side and a template opening pattern (50) comprised of an opening in the template member extending from the front side to the back side of the template member. A humidifier (21) is permanently adhered to a surface of the filter member (20). A primary filtering system (200) has a primary filter medium (201). An attachment means (70) attaches the housing member (10), filter member (20) and template member (30) to the primary filter medium (201) of a primary filtering system (200). The template opening pattern (50) is in the form of alphabetic letters. The housing member is constructed of a transparent or translucent material, such that the front side of the filter member is visible from the front side of the housing member. The front side of the filter member has a first color, and the first color is darker than a color of the particulate.

It is respectfully submitted that the cited prior art reference fails to teach or suggest an end of service life indicator, as claimed in the independent claims of the present invention. Further, there is no suggestion or motivation in the cited prior art regarding the tacky substance of claim 2, the attachment means of claim 3, or the humidifier of claim 8.

Komroff discloses an air conditioner filter indicator located behind and in contact with an air conditioner filter. Referring to Fig. 1, an air conditioner 20 includes a front panel consisting of a stationary portion 19 and an access door 18. Both door 18 and stationary portion 19 have openings to permit passage of air. As shown in the figure, not only are the controls 17 exposed when door 19 is open, but a portion of filter 14 is also exposed. It is this exposed filter portion that is used to indicated condition of the filter and provide reminder to clean the filter. See Col. 2 lines 14-27.

This cited portion of Komroff describes an air conditioner 20 having a front panel consisting of a stationary portion 19 and an access door 18 which is **not part of the indicator and has no role in producing the indicator image**. In the present invention, the front and back sides of the housing member include a plurality of openings that extend from the front side to the back side and are integral components of the ESLI while participating in the forming of an image that indicates the expiration of a fluid filter.

The Official Action referenced col. 2, lines 32-34 which reads in pertinent part "In most recirculating air conditioners, the air is drawn into the air conditioner from the room. The airflow direction is therefore through filter 14 in the direction indicated in Fig. 1." This section was allegedly cited as teaching or suggesting that "each housing

opening allows a fluid and particulates to pass” as recited in independent claims 1 and 8 of the present invention. Applicants respectfully traverse this assertion and point out that the cited section of the reference merely describes the direction of air in the air conditioner and filter. It is clear from the cited reference that only air is circulated through the air conditioner filter. In the present invention, **the aforementioned claim limitation describes the movement of fluids through the end of service life indicator.** Moreover, it is respectfully submitted that the end of service life indicator of the instant invention may be used for **all fluids filters** including but not limited to air, water, and oil. The cited reference does not teach or suggest such a device.

Column 2, lines 42-73 of Komroff reads in part “A preferred embodiment of the present invention including a novel use of this retaining frame will be described in connection with FIGS. 2 and 3. Referring first to FIG. 2, a filter indicating element 10 is shown, having letters 22, supporting members 23 for letters 22, supporting column 25, and partially shown retaining frame 21. It can be seen that the letters 22 spell out the words “WASH ME,” which is a recognizable memory-provoking form. Clearly any legend or indicia suggestive of need for cleaning or changing the filter may be used instead of the words “WASH ME.” The retaining frame 21, including the indicating element 10, is disposed between the filter 14 and the air conditioner cooling coils (not shown) in contact relationship with filter 14. The force of the air stream further presses the filter 14 against the retaining frame 21. The legend portion of said frame 21 is composed of an air-impervious material and is in direct contact with the filter. Airflow will thus be directed through the filter portions not in contact with the legend and substantially no air will be able to flow through that portion of the filter in contact with the

legend. Continued operation of the air conditioner will result in deposition of contaminants on the filter portions through which air is able to pass, causing those portions to darken. The portion of the filter in contact with the legend will remain substantially the original color. The effect of increasing contrast between those portions as the filter becomes dirtier, causes the filter to assume the recognizable memory-provoking form of the legend; with the legend shown in FIG.1, filter 14 will display the words "WASH ME." A viewer seeing these words will therefore be reminded that the filter is dirty and needs cleaning."

The frame (10) having letters 22 described in the cite portion above is merely a solid frame with letters functioning to divert the air stream from the filter in front or back of the frame so the accumulated filtered material on the filter form the indicating image. Whereas, the template described in the present invention is a flat part with certain patterns, fluids pass through the patterns, and filtered materials adhere by the tacky substance within the patterns to form sharp image as indication of end of service, as claimed in claims 2 and 8. This novel design allows the construction of a stand-alone end of service indicator as small as 1" x 1" (2cmx 2cm) that produce a sharp image of indication even for submicron particulates and can be applied to a respiratory filter or any other fluid filters. It is impossible that the referenced frame (10) having letters 22 device be constructed in such small size or produce any image of indication.

Moreover, as claimed in claims 2 and 8, an adhesive material is an integral and functional component of the template of the present invention, which superimposed on the surface of the fibers with certain patterns and therefore traps filtered materials with

much smaller pore size than the filter pore and hence produces a sharp image that indicates the end of service life of the filter.

The end of service life indicator of the present invention is a stand-alone device. It is not necessary for the indicator to be located in proximity to the surface of the filter as in the case of the referenced frame (10) having letters 22 of Komroff. It is only important functionally that the end of service life indicator of the present invention be in the fluid flow. Moreover, in the instant invention the design allows, for example the word "CHANGE" to appear gradually – letter by letter and to be calibrated with the filter to gradually show the increase in the filter resistance, e.g. 20 to 100%. This function is impossible in the case of the referenced frame (10) having letters 22 of Komroff, rather one "indicia" becoming more or less visible, as claimed in the Komroff patent.

The frame (10) having letters 22 of Komroff and the template in the present device are different in shape, construction and functions. Therefore, the frame (10) having letters 22 of Komroff and the template are not interchangeable parts.

In the referenced patent, part of the front wall is shaped with pattern of letters and is literally shading in the washable recyclable filter surface from particulates, therefore preventing this surface from building of "felt" from lint and other particulates. As the appearance and color of this felt maybe different from the original appearance and color of the filter, this difference is used to indicate clogging of the filter. One drawback experienced by Komroff that is not present in the instant invention is that a significant amount of the felt could increase the resistance but the appearance of the Komroff filter is not a measure for the filter resistance. It is recognized that sometimes a small amount of dark dust or lint or both can lead to an appearance of a clogged filter and

large amounts of light, dust and lint maybe underestimated. The Komroff device is directed towards washable filters and/or pre-filters and is completely unusable for fine HEPA filters and other special disposable but expensive filters. There is no way to relate the appearance of a Komroff indicating filter with the aerodynamic resistance of the filter which is monitored. Moreover, Komroff teaches a reusable filter that may be laundered. Thus, he does not contemplate a device that indicates when the useful life of a filter has expired. His device is rough reminder of when the filter should be cleaned rather than an end of service life indicator.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure.

There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. See M.P.E.P. §2143.01 Applicants respectfully submit that Komroff cannot be used to establish a *prima facie* case of obviousness because there is not suggestion or motivation for modifying it to include an end of service life indicator, as claimed in the present invention. Moreover, Komroff does not teach or suggest all of the claim limitations of the present invention. Therefore, it is

respectfully submitted that each of the pending claims as submitted herein recites subject matter that is neither disclosed nor suggested in the cited prior art. Namely, none of the cited prior art discloses or suggests an end of service life indicator, as recited in independent claims 1 and 8.

Applicants respectfully traverse the rejection of the pending claims as being unpatentable and submit that the Komroff reference neither singly or in combination with any other reference teaches or suggests all of the claimed features of the present invention. Further, Applicants strongly submits that the subject matter which distinguishes the present invention from the cited prior art is more than sufficient to render the claimed invention unobvious to a person of ordinary skill in the art. Applicants therefore respectfully request that all of the pending claims be found allowable, and this application be passed to issue.

If for any reason the Examiner determines that the application is not currently in condition for allowance, it is respectfully requested that the Examiner contact by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

Respectfully submitted,



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